

Key Features

es Type ROX Series

High Power with Small Size for Space Saving

Excellent Long Term Stability

Complete Flameproof Construction

Controlled Temperature Capability

Solvent Resistant Coat and Code

Special Lead Formations Possible



The resistive element comprises a metal oxide film deposited on a ceramic former. The element is protected by a flameproof coating which will withstand overload conditions without flame or mechanical damage. They are recommended for use in applications such as line protection etc

Characteristics – Electrical

| | | Rated | Max. | Max. | Dielectric | Resistance | Operating |
|--------|--------|---------|---------|----------|------------|------------|-----------|
| | Туре | Power @ | Working | Overload | Withstand | Range | Temp. |
| | | 70°C | Voltage | Voltage | Voltage | Ω | Range |
| | ROX025 | 0.25W | 250V | 400V | 250V | 0.3 ~ 50K | |
| e | ROX05 | 0.5W | 250V | 400V | 250V | 0.3 ~ 330K | |
| Size | ROX1 | 1W | 350V | 600V | 350V | 0.1~470K | |
| | ROX2 | 2W | 350V | 600V | 350V | 0.1~560K | |
| Normal | ROX3 | 3W | 500V | 800V | 500V | 5.0 ~ 100K | |
| ž | ROX5 | 5W | 750V | 1000V | 750V | 5.0 ~ 150K | °.c |
| | ROX7 | 7W | 750V | 1000V | 750V | 20 ~ 150K | 155°C |
| | ROX8 | 8W | 750V | 1000V | 750V | 30 ~ 200K | 2 |
| | ROX9 | 9W | 750V | 1000V | 750V | 50 ~ 200K | -55 |
| | ROX05S | 0.5W | 250V | 400V | 250V | 0.3 ~ 50K | 71 |
| Size | ROX1S | 1W | 350V | 600V | 350V | 0.3~1M0 | |
| II S | ROX2S | 2W | 350V | 600V | 350V | 0.3 ~ 1M0 | |
| Small | ROX3S | 3W | 350V | 600V | 350V | 0.3~1M0 | |
| S | ROX4S | 4W | 500V | 800V | 500V | 5.0 ~ 100K | |
| | ROX5SS | 5W | 500V | 800V | 500V | 5.0 ~ 100K | |
| | ROX5S | 5W | 500V | 800V | 500V | 5.0 ~ 150K | |

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial line frequency and waveform corresponding to the power rating , as determined from the following formula :

 $RCWV = VP \times R$

Where : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

- P = Power Rating (watt)
- R = Nominal Resistance (ohm)

Rated Voltage = RCWV or Max. Working Voltage, whichever is smaller

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Dimensions in millimetres unless otherwise specified Dimensions Shown for reference purposes only. Specifications subject to change



Environmental Characteristics

| Characteristics | Specifica | tion | Test Methods |
|---------------------------------------|---|--|---|
| DC. Resistance | Must be within the tolerance | | (JIS C 5201-1) 5.1 The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance |
| Temperature Coefficient | Range Ω 0.1Ω ~ 12Ω 12.1Ω ~ 100K 101K ~ 1M 1.1M ~ 10M | TCR (PPM/°C) ±200 ±350 -700 -1500 | 5.2 Natural resistance change per temp. degree centigrade. $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (t ₁) R2: Resistance value at room temp. plus 100 °C (t ₂) |
| Short time overload | Resistance change r Normal Size : ± (1% Small Size : ± (2% + with no evidence of damage | + 0.05Ω) Max. 0.05Ω) Max. | 5.5 Permanent resistance change after the application of a potential of 2.5 times RCWV or the max. overload voltage respectively specified in the above list, whichever less for 5 seconds |
| Dielectric Withstanding Voltage | No evidence of flasl mechanical damage insulation break dov | e, arcing or | 5.7 Resistors shall be clamped in the trough of a 90° metallic V- block and shall be tested at AC potential respectively specified in the electrical characteristics table for 60 + 10/ -0 seconds |
| Terminal Strength | No Evidence of mec damage | hanical | 6.1 Direct load: Resistance to a 2.5 kgs direct load for 10 secs. in the direction of the longitudinal axis of the terminal leads Twist test: Terminal leads shall be bent through 90 ° at point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations. |
| Resistance to soldering heat | Resistance change r ± (1% + 0.05Ω) Max evidence of mechar | . with no | 6.4 Permanent resistance change when leads immersed to 3.2 mm to 4.8 mm from the body in $350^{\circ}C \pm 10^{\circ}C$ solder for 3 ± 0.5 seconds |
| Solderability | 95 % coverage Min. | | 6.5 The area covered with a new , smooth, clean , shiny and continuous surface free from concentrated pinholes. Test temp. of solder: 245°C ± 3°C Dwell time in solder : 2 ~ 3 seconds |

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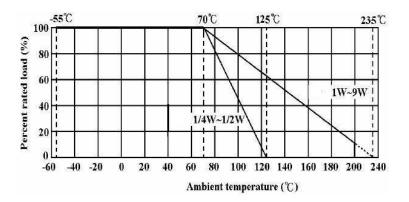


| Characteristics | Specific | cation | | Test Metho (JIS C 5201 | | | | |
|--------------------------|--|---|---------------------------------------|--------------------------------|--|--|--|--|
| Resistance to Solvent | | No deterioration of protective coatings and marking | | | 6.9 Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic | | | |
| | | continuou shown be | | or duty | | | | |
| Temperature | Resistance change | Step | Step | Step | | | | |
| cycling | ± (2% + 0.05Ω) Ma | | 1 | 1 | 1 | | | |
| 6,68 | evidence of mecha | 2 | 2 | 2 | | | | |
| | | 3 | 3 | 3 | | | | |
| | | 4 | 4 | 4 | | | | |
| | Resistance Value | 7.9 Resistance change after 1,000 hours operating at RCWV with | | | | | | |
| | Less than 100KΩ | ∆R/R ±5% | duty cycle of (1.5 hours "on", 0.5 | | | | | |
| Load life in | 100KΩ or more | ± 10 % | | hour "off") in a humidity test | | | | |
| humidity | | chamber controlled at 40 °C ± 2 °C and 90 to 95 % relative humidity | | | | | | |
| | | | 7.10 Perm | 7.10 Permanent resistance | | | | |
| | Resistance Value | ∆R/R | change af | ter 1,000 ho | ours | | | |
| Load life | Less than 100KQ | ±5% | | at RCWV w | , | | | |
| | 100KΩ or more | ± 10 % | | | n", 0.5 hour | | | |
| | | | "off") at 70°C ± 2°C ambient | | | | | |
| Pulse overload | Resistance change Normal Size : ± (2% Small Size : ± (5% + | 5.8 Resistance change after 10,000 cycles (1 second "on", 25 seconds "off") at 4 times RCWV | | | | | | |
| | with no evidence o damage | • | or the max. pulse overload voltage | | | | | |

Environmental Characteristics (continued)

Derating:

In ambient temperatures greater than 70°C the load shall de-rate as shown in the graph below:

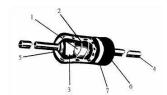


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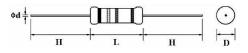


Construction:



| No. | Name | Material | | | | | |
|-----|-----------------|--|-----------------------|--|--|--|--|
| 1 | Basic Body | Rod Type Ceramics | | | | | |
| | | $0.1\Omega \le R \le 12\Omega$: CNP film | For All Wattage | | | | |
| | | $12.1\Omega \le R \le 100K\Omega$: Metal oxide film | 5 4/000 6 4/000 | | | | |
| | | R > 100KΩ : Carbon film | For 1/2W-S, 1/4W | | | | |
| | | $12.1\Omega \le R \le 120K\Omega$: Metal oxide film | 5 4/000 400 6 | | | | |
| | | R > 120KΩ : Carbon film | For 1/2W,1W-S | | | | |
| 2 | Resistance Film | $12.1\Omega \le R \le 150$ K Ω : Metal oxide film | For 1W,2W-S,2W, | | | | |
| | | R > 150KΩ : Carbon film | 3W-S,3W,4W-S,5W-SS | | | | |
| | | $12.1\Omega \le R \le 180K\Omega$: Metal oxide film | | | | | |
| | | R > 180KΩ : Carbon film | — (For 5W,5W-S) | | | | |
| | | $12.1\Omega \le R \le 200K\Omega$: Metal oxide film | (For 7W,8W,9W) | | | | |
| 3 | End Cap | Steel (Tin plated iron surface) | | | | | |
| 4 | Lead Wire | Annealed copper wire coated with tin | | | | | |
| 5 | Joint | By welding | | | | | |
| 6 | Coating | Normal sizeInsulated & Non-Flame Pai | | | | | |
| | | Small sizeInsulated & Non-Flame Paint | : (Color : Sea-Blue) | | | | |
| 7 | Color Code | Non-Flame epoxy resin | | | | | |

Dimensions:



| Туре | | | Dimensio | ns (MM) | |
|--------|--------|----------|----------|---------|------|
| | | D (max.) | L (max.) | d ±0.05 | H ±3 |
| | ROX025 | 2.5 | 7.5 | 0.54 | 28 |
| Size | ROX05 | 3.5 | 10 | 0.70 | 28 |
| | ROX1 | 5 | 12 | 0.70 | 25 |
| | ROX2 | 5.5 | 16 | 0.70 | 28 |
| nal | ROX3 | 6.5 | 17.5 | 0.75 | 28 |
| Normal | ROX5 | 8.5 | 26 | 0.75 | 38 |
| Ž | ROX7 | 8.5 | 32 | 0.75 | 38 |
| | ROX8 | 8.5 | 41 | 0.75 | 38 |
| | ROX9 | 8.5 | 54 | 0.75 | 38 |
| | ROX05S | 2.5 | 7.5 | 0.54 | 28 |
| | ROX1S | 3.5 | 10 | 0.70 | 28 |
| Size | ROX2S | 5 | 12 | 0.70 | 25 |
| IIS | ROX3S | 5.5 | 16 | 0.70 | 28 |
| Small | ROX4S | 6.5 | 17.5 | 0.75 | 28 |
| S | ROX5SS | 6.5 | 17.5 | 0.75 | 28 |
| | ROX5S | 8 | 25 | 0.75 | 38 |

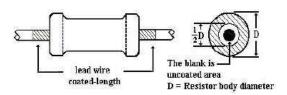
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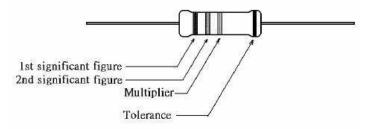
Painting method:

Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the resistor body diameter.

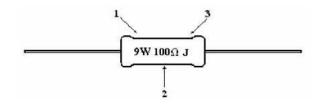


Marking:

For 1/4W, 1/2W, 1W, 2W, 3W, 4W, 5W and all of small size Resistors shall be marked with color coding. colors shall be in accordance with JIS C 0802



For 7W, 8W, 9W marking shall be in text format:



Code description and regulation

- 1. Wattage rating.
- 2. Nominal resistance value.
- 3. Resistance Tolerance.

G: ± 2 %

J: ± 5 %

K: ± 10 %

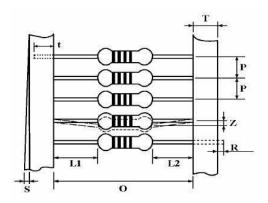
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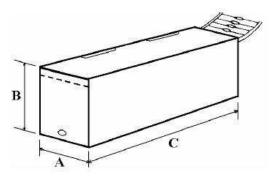
Packing Specification:

Taping:



| | Туре | Style | O±1 | Р | L1-L2 | Т | Z | R | t | S |
|----------|--------|-------|-----|--------|-------|-----|-------|---|-----|---------|
| d) | ROX025 | PT-52 | 52 | 5±0.3 | 1 Max | 6±1 | 1 Max | 0 | 4±1 | 0.5 max |
| Size | ROX05 | PT-52 | 52 | 5±0.3 | 1 Max | 6±1 | 1 Max | 0 | 4±1 | 0.5 max |
| nal | ROX1 | PT-52 | 52 | 5±0.3 | 1 Max | 6±1 | 1 Max | 0 | 4±1 | 0.5 max |
| Normal | ROX2 | PT-64 | 64 | 10±0.5 | 1 Max | 6±1 | 1 Max | 0 | 5±1 | 0.5 max |
| z | ROX3 | PT-64 | 64 | 10±0.5 | 1 Max | 6±1 | 1 Max | 0 | 5±1 | 0.5 max |
| | ROX05S | PT-52 | 52 | 5±0.3 | 1 Max | 6±1 | 1 Max | 0 | 4±1 | 0.5 max |
| | ROX1S | PT-52 | 52 | 5±0.3 | 1 Max | 6±1 | 1 Max | 0 | 4±1 | 0.5 max |
| Size | ROX2S | PT-52 | 52 | 5±0.3 | 1 Max | 6±1 | 1 Max | 0 | 4±1 | 0.5 max |
| Small Si | ROX3S | PT-64 | 64 | 10±0.5 | 1 Max | 6±1 | 1 Max | 0 | 5±1 | 0.5 max |
| | ROX4S | PT-64 | 64 | 10±0.5 | 1 Max | 6±1 | 1 Max | 0 | 5±1 | 0.5 max |
| | ROX5SS | PT-64 | 64 | 10±0.5 | 1 Max | 6±1 | 1 Max | 0 | 5±1 | 0.5 max |

Tape in box packing (Ammopack):



| Туре | C ± 5 | A ± 5 | B ± 5 | Pack Quantity |
|--------|-------|-------|-------|---------------|
| ROX025 | 250 | 75 | 96 | 5000 |
| ROX05 | 260 | 85 | 70 | 1000 |
| ROX1 | 262 | 86 | 80 | 1000 |
| ROX2 | 262 | 92 | 108 | 1000 |
| ROX3 | 256 | 92 | 80 | 500 |
| ROX05S | 250 | 75 | 96 | 5000 |
| ROX1S | 260 | 85 | 70 | 1000 |
| ROX2S | 262 | 86 | 80 | 1000 |
| ROX3S | 262 | 92 | 108 | 1000 |
| ROX4S | 256 | 92 | 80 | 500 |
| ROX5SS | 256 | 92 | 80 | 500 |

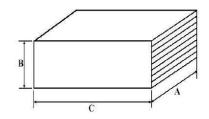
NB Certain products can be supplied reeled on request.

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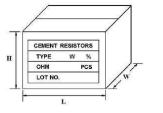


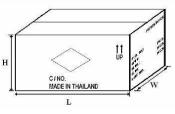
Plastic cases in box:



| Туре | C ±5 | A +E | B ±5 | Quar | itity |
|-------|------|------|------|--------------|-------|
| | C ±5 | A ±5 | CT d | Plastic Case | Box |
| ROX5S | 36 | 20 | 8 | 100 | 1000 |
| ROX5 | 36 | 20 | 8 | 100 | 1000 |

Bulk packaging (plastic bag in inner box):





Inner Box of Plastic bag.

Carton Box

| Туре | Qty/Bag | Qty/Box | Qty/Carton | Box size | Carton size | Gross |
|------|---------|---------|------------|---------------|-------------|--------|
| | (Pcs) | (Pcs) | Pcs | LxWxH (±5) | LxWxH (±5) | wt |
| | | | | | | ±2 Kgs |
| ROX7 | 8 | 32 | 1600 | 150 x 75 x 33 | 432 x 308 x | 9.5 |
| | | | | | 215 | |
| ROX8 | 8 | 32 | 1600 | 150 x 75 x 33 | 432 x 308 x | 11.5 |
| | | | | | 215 | |
| ROX9 | 10 | 300 | 1800 | 200 x 171 x | 520 x 215 x | 15 |
| | | | | 113 | 250 | |

How To Order

| ROX | 1S | | J | 100K | |
|--|--|---|------------------|--|--|
| Common Part | Power Rating | | Tolerance | Resistance Value | Special Request |
| ROX – Flame proof power metal oxide film resistor | Normal size 025 - 1/4W 05 - 1/2W 1 - 1W 2 - 2W 3 - 3W 5 - 5W 7 - 7W 8 - 8W 9 - 9W | Small size 05S - 1/2W 1S - 1W 2S - 2W 3S - 3W 4S - 4W 5SS - 5W 5S - 5W | G – 2% J – 5% | R33 -0.33Ω 1R0 - 1Ω 10R - 10Ω 100R - 100Ω 1K0 - 1KΩ (1000Ω) 100K - 100KΩ (100,000Ω) | BL * – Pre- formed Leads TR - Reeled |

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TE Connectivity: ROX5SSJ1K0